

I CLAIM:

1. The process by which humans can use the force of the muscle contraction of animals (like horses) and the force produced by the animal's gravity) in order to generate electricity by spinning a rotational mechanical device directly or indirectly attached to the hoof or other part of the limbs of the animal, or by means of moving any other matting or treads connected to multiplying gears specifically for this purpose of generation of electricity.

2. A frame (10) configured specifically for the purpose of confining a animal to produce electricity

Said frame configure to have an adjustable sloping rail tracks (Figure 12) (120) to be supported on the ground by at least three points (Figure 1) (14,16,18) attached to said frame (10) and access ramp (2)

Further comprising at least two points for the attachment of the animal to the apparatus (46,48) where the ideal attachment or fixing points of the frame should be located at both sides of the animal and above the animal (49) near its center of gravity in the thorax.

Further comprising at least two foot links (40,42) coupled to at least one rotational mechanism (44), wherein one foot link has a first end an second end; at least four foot supports (Figure 8) (105, 106, 107)

for receiving the hoofs of a horse (or any other part of the limb of the animal) in walking position,

Further comprising at least two small trolleys one foot support located on a adjustable small platform (or wedge shaped) small trolley (122) that runs along the rail tracks (120) with the help of wheels or ball bearings above (125) and below (127)(optional) the track (120) in order to avoid displacement of said trolleys (122) out of the track (120), like for example when the animal produce vigorous movements.

Further comprising said foot supports in connection with at least two foot links for the coupling mechanism.

Further comprising a pivotal axis (Figure 3) (46) for the connection of the foot link to the coupling mechanism is such a way that the foot link produces leverage action of the rotating mechanism because it is acting as a fulcrum.

Further comprising at least one coupling system (44) in rotational communication with at least two-said foot link (184, 200) to translate the stepping motion of a horse into angular momentum;

Further comprising expansion springs along the path of the first links in connection to the first foot or limb link in order to facilitate the movement of the leg out of the trolley when it reaches the resting position Figure 13D (position d).

Further comprising contraction springs or strings with weights (figure 8J) that pass through a guide on the upper most part of the rail tracks in order to constantly pull the leg of the animal to the above-mentioned position.

5 Further comprising at least one generator for electricity or an alternator and converter of electricity or similar device in order to produce it.

Further comprising batteries to store the electricity.

3. 3. An Animal Powered Electricity Generator further comprising an limb  
10 attachment device configured specifically for the purpose of making the animal to produce electricity

Said attachment device (Figure 3, Figure 8A, 8B, 8C, 8D, 8E, 8F, 8G, 8H, 8I, 8J) is designed for attaching the hoof of the animal or any other portion of the limb of the animal in a removable fashion, to said links of  
15 the rotational mechanism in order to obtain the desired effect of generation of electricity.

Further comprising a hinge (107) or similar for the anterior flexion of the hoof at the end of the stride.

Further comprising padded supports at the level of the hoof, cannon  
20 and knee of the animal as well as connecting supporting axels with metal or similar material providing connection among them in order to protect the limb and prevent the joint from dislocations when the animal

Date 01/22/04 /Application number 60/538,408/ Animal Powered Electricity Generator  
is moving for the specific intention of generation of electricity.

4. An Animal Powered Electricity Generator further comprising a restrain and  
suspensor system (Figures 3, Figure 10B) designed specifically for the  
purpose of confining a animal to produce electricity by containing said  
animal (like a horse) within the above mentioned frame,

Further comprising a restrained system consisting of girths (52)  
supported by a inner light material (like aluminum or plastic) (11)  
adjustable frame around the animal

Further comprising a protective and restraining animal shirt (58)  
around the thorax of the animal

Further comprising restraining girths (52,53) supported by  
different cushions (51,55,59) or cushioned tissues to separate the skin  
of the animal from the hard surfaces in order to avoid scratches or any  
skin damage to the animal.

Further comprising holding springs for the animal's (13) that bind  
the animal (figure 3, figure 10B) at both sides of the main frame and  
might hold the animal as well from above (14) near the center of gravity  
of its thorax. Said Suspensor mechanism designed for the specific  
function of allowing the animal to perform the free desired movements of

flexion and extension that are necessary for the generation of electricity while it contributes to minimal friction of the skin of the animal and avoids that the animal gets out of the mechanism

5. An Animal Powered Electricity Generator further comprising a crankshaft  
5 like coupling or rotational system specifically designed for the generation of electricity (Figure 6, Figure 7, Figure 13A, 13B, 13C, 13D (44))

Further comprising a main bigger wheel for accelerating the animal force by means of multiplying gears (Figure 5, 6, 7)

10 Further comprising an attachment place (500, 600, 164) for receiving the different foot links at different degrees of angulations in order to produce a complete 360 degrees of rotation with every single stride of the limbs of the animal.

Further comprising two foot link or limb link in communication with  
15 a foot support on one end, by means of the lever, and in communication to the rotational mechanism on the other end; where said limb links consist of semi rigid flexible bars (184, 200) with springs inside to compensate for the variable force that the animal can produce with the contraction of its muscles.

20 Further comprising a specific place of attachment for receiving the animal weight consisting of a rotational screw (164) with a groove inside

Date 01/22/04 /Application number 60/538,408/ Animal Powered Electricity Generator  
that allows the free movement of a bar (or third link) along it (Figure 6A,  
6B, 6C, 6D)

Further bar directly linked to the limb (or hoof) of the animal (Figure  
3, Figure 13A, 13B, 13C, 13D) on one end and to the rotational  
mechanism on its center (164)

Further comprising one proximal top (160) and a proximal spring  
(162) that produce pressure on the rotational mechanism (44) with the  
weight of the animal and in some form continues to conserve the  
gravity energy after the animal stands on the trolley.

Further comprising said third link with another spring (163) which is  
distal to its attachment point in the rotational mechanism (164) with a  
distal top (165) that allows the continuation of the rotational force of the  
springs on the mechanism at a different angulation's from the first two  
links (184, 200) in order to continue to facilitate the rotation at different  
times of the stride of the animal.

Further comprising levers which can be expansible (Figure 13A,  
13B, 13C, 13D (101,102) by means of springs inside them (102), Figure  
4 (4, 37, 113) directly attached to the limb link on one side and  
attached to the first semi rigid flexible arm (Figure 13) (184) on the other

side of the pivotal axis (46) in such a way that the axis serves as a fulcrum to the movement of the leg in its backward movement producing increased rotational force on the rotational mechanism.

Further comprising a second link (200) attached at approximately the same distance from the pivotal axis (46) as the first link, but in opposite direction, to be attached at approximately 180 degrees in relation to the first link in the crankshaft like mechanism.

Further comprising an anti-reverse screw (700) (Figure 6) in order to make gears rotate only on one direction.

Further comprising at least one big gear (Figure 4, Figure 13A, 13B, 13C, 13D) (11), in direct communication with another smaller gear (9) or in indirect communication with the smaller gear by means of a chain (Figure 4)

(115) wherein said chain or gear translates motion from said gear to said main axis, of the electric generator.

6. A propulsion compensatory heavy weight wheel for the generator further comprising one heavy wheel (900) on either the same axis of the "big" gear or in the same axis of the generator in order to achieve an optimum balance of the machine and in order to facilitate the generation of electricity once the animal pace is steady.

7. A chain shift system (Figure 4) (119) in order to facilitate the starting, which in turn causes the rotation of at least one small wheel to produce variable amount of revolutions per minute according to the desired application of the generator on an at least one electric generator or similar device (1).

8. A stimulator for the animal (3) for compressed air, electricity or other stimulus further comprising a small current battery and pump to provide electric, air or other stimulus to the animal in the skin region of the Ischium bone or any other area in order to arouse the gait of the animal when necessary.



## **Animal Powered Electric Generator**

[ 049]        A system and method for generating electricity by means of the use of biological force (the force of the muscle contraction of animals like horses) and the force produced by the animal's gravity to make rotate a spinning mechanism by means of a device directly or indirectly attached to the hoof or other part of the limbs of the animal.

According to a preferred embodiment, there may be a frame; three points of support to the ground, twelve foot links coupled to at least one generator by means of multiplying gears and chains, two coupling systems in rotational communication with at least three foot links to translate the stepping motion of a horse into angular momentum. The coupling system may have at least one gear connected by a chain to another at least one smaller gear to increase the velocity. Different size gears may be used to control the speed and to regulate the electricity generated according to the desired application.

According to the embodiment of the present invention we can easily produce at least 50 revolutions per second using a first gear fifty times the size of the second gear having in mind the animal can complete a full stride of one single limb in this frame of time (the combined effect of the four limbs working together on the rotational mechanism is greater obviously).

Date 01/22/04 /Application number 60/538,408/ Animal Powered Electricity Generator

According to the embodiment of the present invention If we use a 4-  
pole d-c generator with a simplex –lap armature winding having  
1000000 lines of magnetic flux per pole, with 440 armature face  
conductors, we can generate a voltage of 220 volts/. It is envisioned the  
use of several multiplying gears in the present invention in order to  
achieve higher revolutions and voltage. It is also envisioned the used of  
multiple horses in order to produce increased force on the main axis of  
the generator of electricity or similar device without departing from the  
spirit of the present invention. It is envisioned that technically it is not  
difficult to achieve at least one megawatt of electricity. This is an  
example in order to illustrate how would be the function of the potential  
use of the present invention that because of its production cost and  
weight could be used practically anywhere we can have an animal like  
an echinus moving. This would be just an example in order to illustrate  
how beneficial will be the function and the potential use of the present  
invention.